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Ethnobotanical aspects of trees of Palakkad District, Kerala, India

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Abstract: Trees are one of the most important elements in the forests on which the local and tribal people depend for their multifarious requirements. Apart from their use as food and medicine, majority of the people of the present generation are unaware of their several other potential and indigenous utilisation aspects. The paper puts light on the Ethnobotanical use of 158 species tree involved among the eight tribal groups namely, Eravallans, Irulars, Kadars, Kurumbars, Malamalasars, Malasars, Mudugars and Muthuvans of Palakkad District, Kerala. The information presented here is based on detailed Ethnobotanical studies conducted in the district. The different ethnobotanical uses are classified under food, fodder, medicine and several miscellaneous aspects. The most of the uses mentioned here is hither to unreported and recorded for the first time. The conservation status and utilisation potential of such tree species are also discussed.

Introduction

Man's interest in plants began for his requirement for food and shelter. Subsequently he sought among them remedies for injuries he received during his nomadic life. *Rig Veda* says that man learned to distinguish edible plants from the poisonous ones by observing the way animals used them (Manilal, 1989). Tribals are considered as the torch bearers and custodians of the traditional information on thousands of plants from their surrounding environment evolved in course of continuous observation, trial and error methods and passed on to generations through thousands of years. Anthropologists have identified 43 tribal groups in Kerala. It has been observed that all the tribal groups in Kerala are food gathers or shifting cultivators, dwelling deep in the forest or in the fringes, including protected areas.

Kerala, the land of cultural and biological diversity lies along the southwest corner of peninsular India. Depending on the amount of rainfall, soil type and altitude, different vegetation types are formed in the Western Ghats of Kerala region. The important vegetation occurring in Kerala consists of flowering plants, which have been estimated as 4465 taxa which include 812 trees (Sasidharan, 2003). Among the flowering plants of Kerala, 20 per cent are trees and 30 per cent of them are Western Ghats endemics (Sasidharan, 2006).

Trees are one of the most important elements in the forest in which the local and tribal people depend for their multifarious requirements. Apart from their use as food and medicine majority of the people of the present generation are unaware of their several other potential and indigenous utilisation aspects. Among the fourteen district of the Kerala Idukki district is representing largest number of tree species (434) followed by Palakkad district (359). The utilization aspects of many tree species are unknown due to the lack of detailed scientific documentation. The studies on the traditional use of trees among the Kattunaikka tribe in Wayanad Wild life sanctuary by Narayanan *et al*. (2011) was one exclusive study in this regard. The Ethnobotanical aspects of many

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tree species are hitherto unknown or are poorly documented.

Study area

Palakkad, the largest administrative district in Kerala state, has an area of about 4480 sq. km with a population of 26, 17,482 individuals and is famous for paddy fields and Palmyras. The district lies between 10^{0}15' to 11°15' latitude in the north and 76° and 77^{0}longitude in the east. It is surrounded by Coimbatore district of Tamil Nadu on the east; Malappuram and Thrissur districts on the west; on the north by Malappuram and Nilgiri (state of Tamil Nadu) districts and on the south by Thrissur district. Palakkad forms a natural gap in the Western Ghats and thus connects the west coast with the Deccan Plateau (Fig.1). The district has two major tribal zones, namely Attappady and Parambikkulam among the seven zones, identified for Kerala. Palakkad district, which is the largest district in Kerala, is ranked as the third in the diversity and population of tribals. There are eight tribal groups inhabiting different parts of the district *viz*. Eravallans, Irulars, Kadars, Kurumbars, Malamalasars, Mudugars, Malasars, and Muthuvans. Among them, Irulars, Kurumbars, Mudugars, Malasars, and Muthuvans are shifting cultivators and Non Timber Forest Produce collectors. The Eravallans were former nomadic cultivators and now have turned to mere agricultural labourers due to the various threats and changing situations.

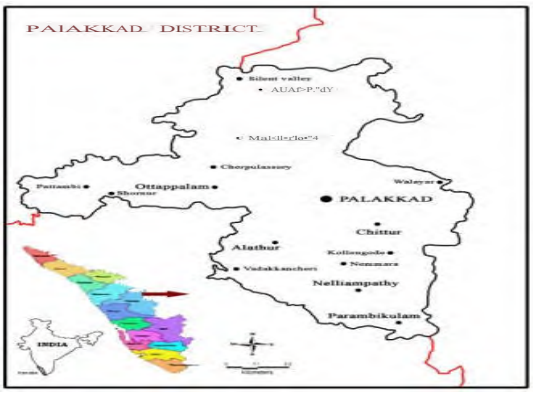

Fig.1. Map of Palakkad District

Materials and methods

Reconnaissance surveys were conducted throughout the district for locating the tribal groups, their distribution, status and traditional way of life, the degree of traditional knowledge practices, *etc*. The selected hamlets were visited regularly and data pertaining to plants, in their life and culture was gathered periodically. Ethnobotanical information was gathered either by interviewing the informants or from the direct observation from the field itself on the uses of plants. Each of the information of a particular plant used among the tribal group was tested directly or indirectly. The reliability of the information of the plants used was assessed after repeated verification.

Result and discussion

The study revealed that there are 158 trees belonging 53 plant families have been documented which directly involved with the life and culture of eight tribal groups **(Appendix I).** Among the total trees documented with indigenous uses there are 143 native trees and 15 cultivated trees. Among them 16 trees found to be endemic to the Western Ghats. The most of the trees are found in Moist deciduous forest (115), followed by Semi evergreen (85), Dry deciduous forests(8), Evergreen (5), Shola forest (3) and planes(4). Some of the trees also adapted more than one habitat(134). There are 65 species represented in both Moist deciduous forest and Semi evergreen forest; 14 species represented in both Semi evergreen and evergreen forests; four trees are found both Moist deciduous forest and Dry deciduous forests and 2 species represented in both Moist deciduous forest and planes. The conservation status of 126 trees is under lower risk, 27 trees are conservation dependent and five trees are came under vulnerable category (IUCN, 2000).

Ethnobotanical aspects

The trees involved in the multifarious needs of the tribal groups are categorised in to 27 useful

aspects. Among the different aspects 104 trees are used in ethno medicines followed by 48 trees with edible parts and the remaining have several other aspects like beliefs, fish stupefaction, hut making, fibres, religious, tooth brush, cleaning agent, masticators, rituals and worships, repellents etc.**(Appendix 1I)**.Regarding the parts of the trees used for various Ethnobotanical aspects bark is most useful part (77 species) followed by fruits (61 species), leaves (35 species), seeds (11 species), wood (8species) *etc*.(**Appendix III**).

The medicinal trees are used for curing 46 human diseases **(Appendix IV A)** and 8 veterinary diseases **(Appendix IV B)**.The number of trees used for different diseases are also analysed and it has been observed that 21 trees are known to the tribal groups for curing stomach ache followed by wound healing (20 trees), diarrhoea (17 trees), scabies and itches (15 trees) and body pain (10 trees). In majority of the medicinal preparations barks are used and the other useful parts include root, leaves, latex, flowers, fruits and seeds. The present study has resulted documentation of the two trees namely *Terminaliatravancorica* and *Prunusceylanicus* which have not been reported with any use earlier and is reported here for the first time as medicine for head ache and piles respectively.The study also result the documentation of the psychoactive property of the bark of *Artocarpusgomzianus*ssp.zeylanica, which has not been recorded for the similar property. Among the 55 plant families represented Fabaceae is represented by 22 trees followed by Euphorbiaceae (14), Moraceae(13), Arecaceae (7) and Rubiaceae (6). Among the eight tribal groups from the study area Mudugars having the highest knowledge on trees (112) followed by Kurumbars (98) and Muthuvans (96).Based on the high utilization potential of the trees which are used by the different tribal groups the trees like *Cocos nucifera Mangifera indica*, *Ficus racemosa, Caryota urens*, *Cycas circinalis*, *Artocarpus hetero-phyllus*, *Azadirachta indica*, *Pterocarpus marsu-pium, Sapindus trifoliata, Grewia tiliiifolia* and *Tamarindus indica* are catogorised under vital ethnic trees which have been playing an important role for the survival of these vanishing communities.

Conclusion

Trees are one of the important components of the forest where the tribes inhabit. Trees are also providing economic, aesthetic and ecological value, which directly involve in the life and culture of the tribal groups in their surrounding environment. Though there are some scattered reports on the ethno botanical uses of few tree species, comprehensive studies are lacking. It has been observed that indigenous uses of the trees are mainly known to few elder members of the tribal groups only and the younger generation withdrawing their traditions associated with plants due to fascination for modern culture. The knowledge potential is directly proportional to the interaction with the surrounding environment. The indigenous uses of the trees distributed in evergreen and semi evergreen forests are poorly known from literature. The utilization aspects of several endemic plants are little known due to lack of documentation. The present study attempts to document all the multifarious uses in comprehensive manner. The study also culminates the documentation of the several hitherto unknown uses, which also include the psychoactive property. The present study also resulted in the selection of the most useful trees among the tribal groups and categorised under vital ethnic trees, which need further studies for the positive measures towards prioritization, sustainable use and management. Modernization, especially industrialization and urbanization has resulted in the dwindling of this rich heritage of knowledge, from among the tribal people of the traditional communities. Therefore, there is an urgent need for documentation of such fast disappearing knowledge, to study and authenticate, validate the various use value of biological resources for future generation and to acquire intellectual property rights for the claim.

Appendix I. Ethnobotanical aspects of trees among the tribal groups of Palakkad District, Kerala India.

Sl.No	Botanical name	Family	Vernacular name	Conservation status	Habitat	Part used	Ethnobotanical aspects
1.	*Acacia nilotica* (L.) Willd. *ex* Del.	Fabaceae	Karuvelam	LR	DDF&PL	Bark	Medicine
2.	*Adenanthera pavonina* L.	Fabaceae	Manjadi	LR	CV	Seeds	Ornaments
3.	*Alangium salvifolium (L. f.)* Wangerin	Alangiaceae	Ankolam	LR	DDF&PL	Bark	Medicine
4.	*Albizia amara* (Roxb.) Boivin.	Fabaceae	Uncha maram	LR	MDF	Bark	Medicine
5.	*Albizia lebbeck* (L.) Willd.	Fabaceae	Vaka	LR	MDF	Bark	Medicine
6.	*Albizia odoratissima* (L. f.) Benth.	Fabaceae	Karuvaka	LR	MDF	Bark	Medicine
7.	*Albizia procera* (Roxb.) Benth.	Fabaceae	Vella nama, vella vaka	LR	MDF	Bark	Medicine
8.	*Alstonia scholaris* (L.) R. Br.	Apocynaceae	Palamaram, Peyepala	LR	MDF	Bark	Medicine, beliefs
9.	*Anacardium occidentale* L.	Anacardiaceae	Parnkima	LR	CV	Bark, fruits	Medicine, edible
10.	*Antiaris toxicaria* Lesch.	Moraceae	Aranjali	CD	SEG	Bark	Bark cloths
11.	*Antidesma ghaesembilla* Gaertn.	Euphorbiaceae	Kambilithoori	LR	SEG	Fruits	Edible
12.	*Antidesma montanum* Blume	Euphorbiaceae	Perum Kodantha	LR	SEG	Fruits	Edible
13.	*Aporosa lindleyana* (Wight) Baill.	Euphorbiaceae	Chavattimaram	LR	SEG	Bark	Medicine
14.	*Ardisia solanacea* Roxb.	Myrsinaceae	Pulipan sappu	LR	MDF&SEG	Leaves	Edible & medicine,
15.	*Areca catechu* L.	Arecaceae	Pakku, Kavungu	LR	CV	Fruits	Medicine, food, ornaments, masticator
16.	*Arenga wightii* Griff.*	Arecaceae	Eayanku, Kattu Thengu, Mala Thengu	VUL	EG	Stem pith, infruitescence, leaves	Medicine,toddy, thatching
17.	*Artocarpus gomezianus* Wall. *ex* Trecul	Moraceae	Theembilachi palam	VUL	MDF&SEG	Fruits & bark	Edible & masticator
18.	*Artocarpus heterophyllus* Lam.	Moraceae	Pila	LR	SEG&EG	Fruits,seeds	Edible, worships & beliefs
19.	*Artocarpus hirsutus* Lam*	Moraceae	Ayani sakkai, Anjili	LR	MDF&SEG	Fruits, seeds	Edible
20.	*Azadirachta indica* A.Juss.	Meliaceae	Veppu	LR	MDF	Bark, stem, leaves	Medicine, tooth brush repellents, beliefs & worships

21.	*Baccaurea courtallensis* (Wight) Muell.*	Euphorbiaceae	Moottil palam, Onapalam	LR	SEG&EG	Fruits	Edible
22.	*Bauhinia racemosa* Lam.	Fabaceae	Aram puli, Kodukam puli	LR	MDF	Leaves, fruit, bark	Edible, medicine, fodder & fibres
23.	*Bombax insigne* Wall.	Bombacaceae	Poolamaram	LR	MDF&SEG	Bark	Medicine
24.	*Borassus flabellifer* L.	Arecaceae	Panai, Karimpanai	LR	CV	Leaves, fruits, fibres, seeds,	Edible, hut making, basketry, ornaments beliefs & brooms
25.	*Briedelia retusa* (L.) Spreng.	Euphorbiaceae	Mullu vengai, Gonchay maram	LR	MDF&SEG	Bark	Medicine
26.	*Butea monosperma* (Lam.) Taub.	Fabaceae	Kolasank, Muthank	LR	MDF&DDF	Leaves, bark	Leaf plates & medicine
27.	*Callicarpa tomentosa* (L.) Murr.	Verbenaceae	Nay thekku, Nedumperuku	LR	MDF&SEG	Bark	Medicine
28.	*Calophyllum polyanthum* Wall. *ex* Choisy	Clusiaceae	Malampunna	LR	EG	Bark	Medicine
29.	*Canarium strictum* Roxb.	Burseraceae	Kunkillyam	CD	SEG&EG	Resin	Repellent
30.	*Canthium rheedei* DC.	Rubiaceae	Kara	LR	MDF&SEG	Fruits	Fish stupefaction
31.	*Careya arborea* Roxb.	Lecithadaceae	Peku	LR	MDF&SEG	Bark	Medicine
32.	*Carica papaya* L.	Caricaceae	Pappaya	LR	CV	Leaves and fruits	Edible & medicine
33.	*Caryota urens* L.	Arecaceae	Koontha Panai, Eranpana	CD	MDF&SEG	Stem pith, Leaf peduncle fruits,	Edible, fish stupefaction, fibres & medicine
34.	*Cassia fistula* L.	Fabaceae	Konnai	LR	MDF	Roots, leaves, bark	Medicine
35.	*Catunaregam spinosa* (Thunb.) Tirveng.	Rubiaceae	Malankara	LR	MDF&SEG	Fruits and thorns	Fish stupefaction & needle
36.	*Chloroxylon swietenia* DC.	Flindersiaceae	Porisu	CD	MDF&PL	Leaves	Fish stupefaction
37.	*Cinnamomum malabatrum* (Burm. f.) Blume	Lauraceae	Shanthamaram	LR	MDF&SEG	Bark	Medicine
38.	*Citrus limon* (L.) Burm. f.	Rutaceae	Elimichi	LR	CV	Fruit	Medicine

39.	*Cleistanthus collinus* (Roxb.) Benth.	Euphorbiaceae	Oduku	LR	MDF	Leaves	Medicine
40.	*Cochlospermum religiosum* (L.) Alston	Cochlospermaceae	Appakudukka	CD	MDF	Fruits	Artifact
41.	*Cocos nucifera* L.	Arecaceae	Thengu	LR	CV	Oil from kernel of seeds	Medicine, edible & worships
42.	*Cordia obliqua* Willd.	Boraginaceae	Thumba, Cheruviri	LR	MDF	Fruits, bark	Edible & medicine
43.	*Cordia wallichii* G. Don	Boraginaceae	Viri	LR	MDF	Fruits	Edible
44.	*Corypha umbraculifera* L.*	Arecaceae	Kodapana	VUL	MDF	Leaves	Thatching & umbrella and basketry
45.	*Crataeva magna* (Lour.) DC.	Capparaceae	Poothalukay	CD	MDF&SEG	Fruits	Fish stupifaction
46.	*Cullenia exarillata* Robyns *	Culliniaceae	Karanipu	LR	EG	Flowers and seeds	Edible
47.	*Cycas circinalis* L.*	Cycadaceae	Eanth, Konkan	CD	MDF	Leaves , seed, bark	Edible & medicine
48.	*Dalbergia lanceolaria* L. f.	Fabaceae	Parisakanchi	LR	MDF	Leaves	Medicine
49.	*Dalbergia latifolia* Roxb.	Fabaceae	Kariveeti	LR	MDF	Bark and wood	Medicine & hut making
50.	*Dalbergia sissoides* Graham *ex* Wight & Arn.	Fabaceae	Veeti	LR	MDF	Bark and wood	Medicine, musical instrument & hut making
51.	*Dendrocnide sinuata* (Blume) Chew.	Urticaceae	Anavirati, Chudukolu, Thattapila	LR	EG	Leaves and stem	Medicine
52.	*Dillenia pentagyna* Roxb.	Dilliniaceae	Vazham punna	LR	MDF	Leaves and bark	Plates & fish stupefaction
53.	*Diospyros cordifolia* Roxb.	Ebenaceae	Vakkanai maram	LR	MDF&SEG	Leaves and stem	Fish stupefaction
54.	*Elaeocarpus glandulosus* Wall. *ex* Merr.	Elaeocarpaceae	Koduvashimaram	LR	SEG&EG	Fruits	Edible
55.	*Elaeocarpus tuberculatus* Roxb.	Elaeocarpaceae	Kara	LR	SEG&EG	Bark	Medicine
56.	*Erythrina stricta* Roxb.	Fabaceae	Mullu Murukku	LR	MDF&SEG	Leaves	Fodder
57.	*Erythrina variegata* L.	Fabaceae	Kattu Murukku	LR	MDF&SEG	Leaves, bark	Medicine & fodder

58.	*Eugenia indica* (Wight) Chithra	Myrtaceae	Nara	LR	MDF&SEG	Fruits	Edible
59.	*Euphorbia antiquorum* L.	Euphorbiaceae	Thriukkalli, Kalli	LR	DDF	Latex	Medicine
60.	*Fagraea ceylanica* Thunb.	Loganiaceae	Kalmurali	LR	SEG	Bark	Medicine for livestock
61.	*Ficus benghalensis* L.	Moraceae	Alamaram	LR	MDF&SEG	Bark	Medicine & beliefs
62.	*Ficus drupacea* Thunb. var. *pubescens* (Roth) Corner	Moraceae	Periathi	LR	MDF&SEG	Fruits	Edible
63.	*Ficus exasperata* Vahl	Moraceae	Villuragi	LR	MDF&SEG	Leaves and bark	Cleaning agent & Medicine
64.	*Ficus hispida* L.	Moraceae	Thunali	LR	MDF&SEG	Leaves and bark	Fodder & medicine
65.	*Ficus microcarpa* L.f.	Moraceae	Sinnathi	LR	MDF&SEG	Bark	Beliefs
66.	*Ficus racemosa* L.	Moraceae	Athipalam	LR	MDF&SEG	Leaves, bark, fruits	Fodder, fibre , edible, medicine & beliefs
67.	*Ficus religiosa* L.	Moraceae	Alamram	LR	MDF&SEG	Bark	Medicine & beliefs
68.	*Ficus tinctoria* G. Forst. ssp. *parasitica* (Koen. *ex* Willd.) Corner	Moraceae	Paraveeti, Pullal, Siral	LR	MDF&SEG	Bark	Medicine & beliefs
69.	*Flacourtia montana* Graham	Flacourtiaceae	Chaliru palam, Silamby palam	LR	MDF&SEG	Fruits	Edible
70.	*Garcinia gummi-gutta* (L.) Robs.	Clusiaceae	Kodam puli, Korukka puli	LR	EG&SHOLA	Fruit, bark	Edible& Medicine
71.	*Gardenia resinifera* Roth.	Rubiaceae	Murinchi	CD	SEG&EG	Bark	Medicine
72.	*Givotia moluccana* (L.) Sreem.	Euphorbiaceae	Vedari	LR	MDF&SEG	Fruits	Edible
73.	*Gliricidia sepium* (Jacq.) Kunth *ex* Walp.	Fabaceae	Seema konna	LR	CV	Leaves	Fodder
74.	*Gmelina arborea* Roxb.	Verbenaceae	Goolimaram, Kummulumaram	LR	MDF	Bark, wood	Medicine, musical instrument & house hold articles

75.	*Gnidia glauca* (Fresen.) Gilg	Thymeliaceae	Karananchu	LR	EG&SHOLA	Tender shoots and fruits	Fish stupefaction
76.	*Grewia glabra* Blume	Tiliaceae	Kadamudaki	LR	MDF	Roots	Medicine
77.	*Grewia tiliifolia* Vahl	Tiliaceae	Unnam, Lummay	LR	MDF	Fruits, bark	Edible, fibre & shampoo
78.	*Haldina cordifolia* (Roxb.) Ridsd.	Rubiaceae	Chudalatholmaram, Manjakadambu	LR	MDF	Bark	Medicine
79.	*Harpullia arborea* (Blanco) Radlk.	Sapindaceae	Irukoli maram, Pookoli maram	LR	MDF&SEG	Bark	Repellent
80.	*Helicteres isora* L.	Sterculiaceae	Kaivan, Kevri	LR	MDF	Fruits and bark	Medicine and fibres
81.	*Holarrhena pubescens* (Buch.-Ham.) Wall. *ex* G. Don	Apocynaceae	Perumpala	LR	MDF	Latex	Medicine
82.	*Holigarna arnottiana* Hook. f.	Anacardiaceae	Cheru	CD	MDF&SEG	Resinous exudates from seeds	Medicine
83.	*Holoptelea integrifolia* (Roxb.) Planch.	Ulmaceae	Ayamaram	LR	MDF&DDF	Leaves	Medicine
84.	*Hopea ponga* (Dennst.) Mabber.*	Dipterocarpaceae	Pongamaram, Karimpongu	CD	MDF&SEG	Bark	Medicine
85.	*Hydnocarpus alpina* Wight	Flacourtiaceae	Marotti	LR	SEG&EG	Fruits	Medicine
86.	*Hydnocarpus pentandra* (Buch.-Ham.) Oken *	Flacourtiaceae	Kalali kay	CD	MDF&SEG	Fruits	Medicine & fish stupefaction
87.	*Jatropha curcas* L.	Euphorbiaceae	Kotta, Kottavanakku, Kadalavanakku	LR	MDF	Latex, tender shoots, oil,	Medicine and fuel
88.	*Kydia calycina* Roxb.	Malvaceae	Vekki maram	LR	MDF	Bark	Shampoo
89.	*Lagerstroemia microcarpa* Wight	Lythraceae	Venthekku	LR	MDF	Bark	Medicine
90.	*Macaranga peltata* (Roxb.) Muell.	Euphorbiaceae	Vattakanni	LR	MDF&SEG	Bark, leaves	Medicine & plates

91.	*Madhuca indica* J. Gmelin	Sapotaceae	Ilupei	CD	MDF&SEG	Flowers, fruits, latex	Edible& medicine
92.	*Mallotus philippensis* (Lam.) Muell.	Euphorbiaceae	Kathivettumaram	LR	MDF&SEG	Bark	Medicine & house hold articles
93.	*Mallotus tetracoccus* (Roxb.) Kurz	Euphorbiaceae	Pokkumaram	LR	MDF&SEG	Bark	Medicine
94.	*Mangifera indica* L.	Anacardiaceae	Kattumangai, Kattumoochi	LR	MDF&SEG	Fruits, leaves,	Edible ,tooth brush, medicine,, worships & beliefs
95.	*Mastixia arborea* (Wight) Bedd. ssp. *meziana* (Wang.) Matthew	Cornaceae	Mattipalamarm	CD	MDF&SEG	Resin	Repellent
96.	*Melia dubia* Cav.	Meliaceae	Malaveppu	LR	MDF&SEG	Fruits	Medicine
97.	*Mesua ferrea* L.	Clusiaceae	Eva , Nanka	CD	SEG&EG	Fruits	Edible, medicine, hut making & house hold articles
98.	*Mesua thwaitesii* Planch. & Triana	Clusiaceae	Mullai maram	CD	SEG&EG	Fruits	Edible & hut making
99.	*Mimusops elengi* L.	Sapaotaceae	Elenji	LR	MDF&SEG	Fruits	Edible
100.	*Mitragyna parvifolia* (Roxb.) Korth.	Rubiceae	Neerthonku	LR	MDF&PL	Bark	Medicine
101.	*Moringa pterygosperma* Gaertn.	Moringaceae	Muringa	LR	CV	Leaves, fruits ,bark	Edible & medicine
102.	*Myristica beddomei* King	Myristicaceae	Kattu jathi. Pathripoovu	LR	SEG&EG	Fruits	Medicine
103.	*Myristica fragrans* Houtt.	Myristicaceae	Jathi	LR	CV	Fruits	Medicine

104.	*Naringi crenulata* (Roxb.) Nicols.	Rutaceae	Nayelumbichi	LR	MDF	Fruits	Medicine
105.	*Neolamarckia cadamba* (Roxb.) Bosser.	Rubiaceae	Kadambu	CD	MDF&SEG	Bark	Medicine
106.	*Olea dioica* Roxb.	Oleaceae	Edalamaram	LR	MDF&SEG	Wood	Beliefs
107.	*Oroxylum indicum* (L.) Benth. *ex* Kurz	Bignoniacea	Payyani, Palaka Payyani	CD	MDF&SEG	Roots	Medicine
108.	*Palaquium ellipticum* (Dalz.) Baill.*	Sapotaceae	Pali	LR	SEG&EG	Fruits	Edible
109.	*Persea macrantha* (Nees) Kosterm.	Luaraceae	Kulamavu	LR	MDF&SEG	Bark	Medicine
110.	*Phyllanthus emblica* L.	Euphorbiaceae	Nelli	LR	MDF&SEG	Fruits, bark	Edible & medicine
111.	*Pinanga dicksonii* (Roxb.) Blume *	Arecaceae	Katupaku, Tevarupaku	VUL	SEG&EG	Shoots, fruits	Edible & masticator
112.	*Pithecellobium dulce* (Roxb.) Benth.	Fabaceae	Kodukkam puli, Puli	LR	MDF	Fruits	Edible
113.	*Pittosporum neelgherrense* Wight & Arn.*	Pittosporaceae	Analivegam	CD	EG&SHOLA	Bark	Medicine
114.	*Polyalthia coffeoides* (Thw.) J. Hk. & Thoms.	Annonaceae	Villa Nedunar	LR	MDF&SEG	Fruits	Edible
115.	*Polyalthia fragrans* (Dalz.) Bedd.	Annonaceae	Nedunar	LR	MDF&SEG	Fruits	Edible
116.	*Pongamia pinnata* (L.) Pierre.	Fabaceae	Pongamaram	LR	MDF&SEG	Bark, Leaves	Medicine, worships & beliefs
117.	*Prunus ceylanica* (Wight) Miq.	Rosaceae	Narakengamaram	CD	MDF&SEG	Bark	Medicine
118.	*Psidium guajava* L.	Myrtaceae	Perai, Koyyamaram	LR	CV	Fruits	Edible & medicine
119.	*Pterocarpus marsupium* Roxb.	Fabaceae	Vengi	LR	MDF	Bark, wood	Medicine, musical instrument & house hold articles
120.	*Pterocarpus santalinus* L.f.	Fabaceae	Chandragiri	CD	MDF	Wood	Medicine

121.	*Radermachera xylocarpa* (Roxb.) K. Schum.	Bignoniaceae	Pasadai	LR	MDF	Bark	Medicine
122.	*Ricinus communis* L.	Euphorbiaceae	Thonda Kattaimutha, Mudugar thondi	LR	MDF &CV	Seeds	Medicine
123.	*Salix tetrasperma* Roxb.	Saliccaceae	Meenuvayyemaram	CD	MDF&SEG	Bark	Medicine
124.	*Santalum album* L.	Santalaceae	Sandanam	CD	DDF&MDF	Wood	Medicine
125.	*Sapindus trifoliata* L.	Sapindaceae	Poocha kottai, Uruvanch, Shenkittamaram	LR	MDF	Bark, fruits	Medicine, fish stupefaction, repellents & soap
126.	*Schefflera venulosa* (Wight & Arn.) Harms	Aralliaceae	Malaimaruli	LR	SEG	Tender leaves and bark	Medicine
127.	*Schleichera oleosa* (Lour.) Oken	Sapindaceae	Poovamaram, Cheruchudali	LR	MDF&SEG	Bark, leaves	Medicine & beliefs
128.	*Scolopia crenata* (Wight & Arn.) Clos	Flacourtiaceae	Chithali	CD	MDF	Fruits	Edible
129.	*Semecarpus anacardium* L. f.	Anacardiaceae	Cheru	LR	MDF	Fruits	Edible& Medicine
130.	*Sesbania grandiflora* (L.) Poir.	Fabaceae	Agathi	LR	CV	Leaves, flowers, fruits	Edible
131.	*Sterculia foetida* L.	Sterculiaceae	Kavalam	LR	MDF&SEG	Seeds	Edible
132.	*Sterculia guttata* Roxb. *ex* DC.	Sterculiaceae	Peenari, Achane	LR	MDF&SEG	Bark	Medicine
133.	*Sterculia urens* Roxb.	Sterculiaceae	Pakshavu	LR	MDF&SEG	Bark	Medicine
134.	*Sterculia villosa* Roxb. *ex* DC.	Sterculiaceae	Vakka	LR	MDF&SEG	Bark	Fibres
135.	*Stereospermum colais* (Buch.-Ham. *ex* Dillw.) Mabb.	Bignoniaceae	Pathirti	LR	MDF&SEG	Bark	Medicine
136.	*Streblus asper* Lour.	Moraceae	Parukkamaram	LR	MDF&SEG	Bark	Medicine
137.	*Strychnos nux-vomica* L.	Loganiaceae	Kanchiram	LR	MDF	Bark, leaves	Medicine, fish stupefaction & Repellent
138.	*Symplocos cochinchinensis* (Lour.) Moore ssp. *laurina* (Retz.)Nooteb.	Symplocaceae	Paralai maram	LR	MDF&SEG	Stem	Tooth brush

139.	*Syzygium caryophyllatum* (L.) Alston in Trimen	Myrtaceae	Mani neera	LR	MDF&SEG	Fruits	Edible
140.	*Syzygium cumini* (L.) Skeels	Myrtaceae	Nava, Njavalu, Neera	LR	MDF&SEG	Fruits	Edible &medicine
141.	*Syzygium densiflorum* Wall. *ex* Wight & Arn.*	Myrtaceae	Cherunava, Mundineera	VUL	MDF&SEG	Fruits	Edible
142.	*Syzygium mundagam* (Bourd.) Chithra in Nair& Henry	Myrtaceae	Kuruvineera	LR	MDF&SEG	Fruits	Edible
143.	*Tabernaemontana heyneana* Wall. *	Apocynaceae	Koonanpala	LR	MDF&SEG	Latex	Medicine
144.	*Tamarindus indica* L.	Fabaceae	Pulingi	LR	CV	Fruits, seeds	Edible & milk coagulant
145.	*Tamilnadia uliginosa* (Retz.) Tirveng. & Sastry	Rubiaceae	Vellanochi, Pindichakka	CD	MDF&SEG	Fruits	Edible
146.	*Tectona grandis* L. f.	Verbenaceae	Thekkamaram	LR	MDF&DDF	Leaves and wood	Medicine, leaf plates & hut making
147.	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	Thannimaram	LR	MDF	Bark	Medicine
148.	*Terminalia elliptica* Willd.	Combretaceae	Karimaram	LR	MDF	Bark	Medicine
149.	*Terminalia paniculata* Roth.	Combretaceae	Pullamaruthu	LR	MDF	Bark	Medicine
150.	*Terminalia travancorensis* Wight & Arn.*	Combretaceae	Kattu kadukka	CD	MDF&SEG	Fruits	Medicine
151.	*Trema orientalis* (L.) Blume	Ulmaceae	Amaithalai	LR	PL	Leaves, bark	Fodder & fibre
152.	*Vaccinium neilgherrense* Wight *	Vacciniaceae	Malai Vanchi	CD	SEG&EG	Bark	Medicine
153.	*Vateria indica* L.*	Dipterocarpaceae	Vella Kunkillyam	CD	SEG&EG	Resin	Repellent
154.	*Vitex negundo* L.	Verbenaceae	Nochi	LR	MDF&SEG	Leaves, bark	Medicine
155.	*Wrightia tinctoria* (Roxb.) R. Br.	Apocynaceae	Palai, Nelam palai	LR	MDF&DDF	Leaves, bark	Medicine & milk coagulant
156.	*Xylia xylocarpa* (Roxb.) Taub.	Fabaceae	Irumullu	LR	MDF	Seeds	Edible
157.	*Zanthoxylum rhetsa* (Roxb.) DC.	Rutaceae	Mullilamaram	LR	MDF	Bark	Medicine
158.	*Zizyphus mauritiana* Lam.	Rhamnaceae	Perumsoori	LR	MDF&SEG	Fruits	Edible

CD: Conservation dependent; **CV**: Cultivated; **DDF**: Dry deciduous forest; **EG**: Evergreen forest; **LR**: Lower risk; **MDF**: Moist deciduous forest **SHOLA**: Montane wet temperate forests; **PL**: Planes; **SEG**: Semi Evergreen; **TR**: Trees; **VUL**: Vulnerable; * indicates endemic plants.

Appendix II. Utilization aspects of trees

Sl No	Utilization aspects	Number of trees used
1.	Basketry	2
2.	Beliefs	13
3.	Brooms	2
4.	Cleaning vessels	1
5.	Cloth	1
6.	Soil binder	2
7.	Edible parts	48
8.	Fibres	7
9.	Fish stupefaction	11
10.	House hold articles	4
11.	Hut making	6
12.	Leaf for food	4
13.	Masticators	4
14.	Medicinal	104
15.	Milk coagulant	2
16.	Musical instrument	3
17.	Ornaments	5
18.	Plants in songs	6
19.	Religious rituals	7
20.	Repellents	7
21.	Shampoo	2
22.	Soaps	1
23.	Tooth brush	4
24.	Torches	1
25.	Traditional mark	1
26.	Trap	1
27.	Utensils	2

Apendix III. Parts of the trees used by the tribal groups

Useful Parts	**Number trees represented**
Bark	77
Fruits	61
Leaves	35
Seeds	11
Wood	8
Resin	5
Latex	5
Stem	4
Stem pith	3
Flower	3
Infruitescence	1
Thorns	1

Appendix IV A. Human ailments and medicinal trees used

Botanical name and diseases	**Family**
1. Abortion	
Careya arborea	Lecythidaceae
Carica papaya	Caricaceae
2. Allergy	
Dendrocnide sinuata	Urticaceae
Terminalia bellirica	Combretaceae
Cordia obliqua	Boraginaceae
3. Back pain	
Terminalia bellirica	Combretaceae
Terminalia paniculata	Combretaceae
4. Body pain	
Cassia fistula	Fabaceae
Ficus tinctoria	Moraceae
Haldina cordifolia	Rubiaceae
Mitragyna parvifolia	Rubiaceae
Psidium guajava	Myrtaceae
Pterocarpus marsupium	Fabaceae
Schleichera oleosa	Sapindaceae
Terminalia bellirica	Combretaceae
Terminalia paniculata	Combretaceae
Vitex negendo	Verbenaceae
5. Burns	
Hopea ponga	Dipterocarpaceae
Pterocarpus marsupium	Fabaceae
6. Chest pain	

Acacia nilotica	Fabaceae
7. Contraception	
Careya arborea	Lecythadaceae
Cassia fistula	Fabaceae
Dalbergia latifolia	Fabaceae
Albizia odoratissima	Fabaceae
8. Cooling agent	
Mallotus tetracoccus	Euphorbiaceae
9. Couph and cold	
Garcinia gummigutta	Clusiaceae
Sapindus trifoliata	Sapindaceae
Sterculia guttata	Sterculiaceae
10. Crack in heals	
Melia dubia	Meliaceae
11. Diarrhoea	
Aporosa lindleyana	Euphorbiaceae
Careya arborea	Lecythadaceae
Carica papaya	Caricaceae
Cassia fistula	Fabaceae
Cleistanthus collinus	Euphorbiaceae
Dalbergia latifolia	Fabaceae
Dalbergia sissoides	Fabaceae
Ficus racemosa	Moraceae
Holarrhena pubescens	Apocynaceae
Hopea ponga	Dipterocarpaceae
Lagerstroemia microcarpa	Lythraceae
Phyllanthus emblica	Euphorbiaceae
Syzygium cumini	Myrtaceae
Terminalia elliptica	Combretaceae
12. Dysentry	
Dalbergia latifolia	Fabaceae
Myristica beddomei	Myristicaeae
13. Epilepsy	
Butea monosperma	Fabaceae
Dalbergia lanceolaria	Fabaceae
Sterculia urens	Sterculiaceae
14. Eye diseases	
Holarrhena pubescens	Apocynaceae
Tabernaemontana divaricata	Apocynaceae
15. Fertility	
Schleichera oleosa	Sapindaceae
Terminalia bellirica	Combretaceae
16. Fever	
Azadirachta indica	Meliaceae
Cassia fistula	Fabaceae
Garcinia gummigutta	Clusiaceae
Jatropha curcas	Euphorbiaceae

Neolamarckia cadamba	Rubiaceae
Stereospermum colais	Bignoniaceae
17. Foot corn	
Holigarna arnottina	Anacardiaceae
18. Furuncle	
Grewia glabra	Tiliaceae
19. Head ache	
Careya arborea	Lecythadaceae
Albizia amara	Fabaceae
Azadirachta indica	Meliaceae
Elaeocarpus tuberculatus	Eleocarpaceae
Jatropha curcas	Euphorbiaceae
Moringa pterygosperma	Moringaceae
Murraya paniculata	Rutaceae
Ricinus communis	Euphorbiaceae
Santalaum album	Santalaceae
Terminalia travancorensis	Combretaceae
20. Indigestion	
Areca catechu	Arecaceae
Cassia fistula	Fabaceae
Lagerstroemia microcarpa	Lythraceae
Pterocarpus marsupium	Fabaceae
21. Inflammation	
Albizia procera	Fabaceae
Cassia fistula	Fabaceae
22. Insect sting	
Areca catechu	Arecaceae
Cocos nucifera	Arecaceae
23. Jaundice	
Alstonia scholaris	Apocynaceae
Terminalia bellirica	Combretaceaew
24. Joint pain	
Euphorbia antiquorum	Euphorbiaceae
25. Madness	
Careya arborea	Lecythadaceae
26. Milk production	
Strebulus asper	Moraceae
27. Mother care	
Cordia wallichii	Boraginaceae
28. Nourishment of hair	
Ficus benghalensis	Moraceae
29. Oedema	
Erythrina variegata	Fabaceae
Botanical name and diseases	**Family**
30. Pediculosis	
Hydnocarpus pendandra	Falcourtiaceae
31. Piles	

Albizia amara	Fabaceae
Prunus ceylanica	Rosaceae
32. Placenta release	
Callicarpa tomentosa	Verbenaceae
Carica papaya	Caricaceae
Sterculia guttata	Sterculiaceae
33. Psoriasis	
Pongamia pinnata	Fabaceae
Wrightia tinctoria	Apocynaceae
34. Rabies	
Alangium salvifolium	Alangiaceae
35. Respiratory trouble	
Bauhinia racemosa	Fabaceae
Phyllanthus emblica	Euphorbiaceae
Pterocarpus marsupium	Fabaceae
Sapindus trifoliata	Sapindaceae
Trema orientalis	Ulmaceae
36. Rheumatism	
Cassia fistula	Fabaceae
Pterocarpus marsupium	Fabaceae
Radomachera xylocarpa	Bignoniaceae
37. Scabies and itches	
Calophyllum polyanthum	Clusiaceae
Cassia fistula	Fabaceae
Cocos nucifera	Arecaceae
Erythrina stricta	Fabaceae
Hydnocarpus alpina	Flacourtiaceae
Mesua ferrea	Clusiaceae
Moringa pterigosperma	Morigaceae
Pongamia pinnata	Fabaceae
Psidium guajava	Myrtaceae
Strebulus asper	Moraceae
Strychnos nux-vomica	Loganiaceae
Tabernaemontana heyneana	Apocynaceae
Wrightia tinctoria	Apocynaceae
Zanthoxylum rhetsa	Rutaceae
38. Skin infection	
Albizia lebbeck	*Fabaceae*
Alstonia scholaris	*Apocynaceae*
Cocos nucifera	*Arecaceae*
Dalbergia lanceolaria	*Fabaceae*
Wrightia tinctoria	*Apocynaceae*
39. Small pox	
Azadirachta indica	*Meliaceae*
40. Snake bite	
Cassia fistula	Fabaceae
Holarrhena pubescens	Apocynaceae

Oroxylum indicum	Bignoniaceae
Pittosporum neelgherrense	Pittosporaceae
Pterocarpus santalinus	Fabaceae
Strychnos nux-vomica	Loganiaceae
Vaccinium neilgherrense	Vacciniaceae
41. Stomach ache	
Azadirachta indica	Meliaceae
Bombax insigne	Bombacaeae
Briedelia retusa	Euphorbiaceae
Carica papaya	*Caricaeae*
Dalbergia latifolia	Fabaceae
Dalbergia sissoides	Fabaceae
Ficus exasperata	Moraceae
Ficus racemosa	Moraceae
Ficus tinctoria	Moraceae
Hopea ponga	Dipterocrapaceae
Mangifera indica	Anacardiaceae
Moringa pterygosperma	Moringaceae
Myristica beddomei	Myristicaceae
Myristica fragrance	Myristicaceae
Naringi crenulata	Rutaceae
Phyllanthus emblica	Euphorbiaceae
Pterocarpus marsupium	Fabaceae
Salix tetrasperma	Salicaceae
Terminalia bellirica	Combretaceae
Terminalia elliptica	Combretaceae
42. Throat infection	
Elaeocarpus glandulosus	Elaeopcarpaceae
43. Tooth ache	
Acacia nilotica	Fabaceae
Aporosa lindleyana	Euphorbiaceae
Careya arborea	Lecythadaceae
Carica papaya	Caricaceae
Ficus religiosa	Moraceae
Mecaranga peltata	Euphorbiaceae
Mallotus philippensis var.phillippensis	Euphorbiaceae
Mangifera indica	Anacrdiaceae
Phyllanthus emblica	Euphorbiaceae
Pinanga dicksonii	Arecaeae
Stereospermum colais	Bignoniaceae
Syzygium cumini	Myrtaceae
Wrightia tinctoria	Apocynaceae
44. Whooping cough	
Phyllanthus emblica	Euphorbiaceae

45. Worm trouble	
Alstonia scholaris	Apocynaceae
46. Wound healing	
Acacia nilotica	Fabaceae
Adiantum philippense	Adianaceae
Alstonia scholaris	Apocynaceae
Arenga wightii	Arecaceae
Borassus flabellifer	Arecaceae
Callicarpa tomentosa	Verbenaceae
Caryota urens	Arecaceae
Cinnamon malabatrum	Luaraceae
Cocos nucifera	Arecaeae
Ficus benghalensis	Moraceae
Ficus tinctoria	Moraceae
Jatropha curcas	Euphorbiaceae
Mallotus philippensis	Euphorbiaceae
Mallotus tetracoccus	Euphorbiaceae
Pinanga dicksonii	Arecaeae
Pongamia pinnata	Fabaceae
Tectona grandis	Verbenaceae
Wrightia tinctoria	Apocynaceae

Appendix IV B. Diseases in livestock and medicinal trees

Botanical name	**Family**
1. Foot and mouth disease	
Cleistanthus collinus	Euphorbiaceae
Fagraea ceylanica	Loganiaceae
Persea macrantha	Lauraceae
Schefflera venulosa	Aralliaceae
Semecarpus anacardium	Anacardiaceae
Ttectona grandis	Verbenaceae
2. Indigestion	
Azadirachta indica	Meliaceae
3. Milk production	
Ficus hispida	Moraceae
5. Placenta release	
Artocarpus heterophyllus	Moraceae
Ficus hispida	Moraceae
6. Rheumatism	
Pongamia pinnata	Fabaceae
7. Wound infested with worms	
Erythrina verigata	Fabaceae
Ficus exasperata	Moraceae
Mangifera indica	Anacrdiaceae
Psidium guajava	Myrtaceae

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